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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,326	05/16/2006	Karl-Heinz Daum	4791-4000	1670

27123 7590 01/22/2009

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EXAMINER	
LEE, REBECCA Y	

ART UNIT	PAPER NUMBER
4181	

NOTIFICATION DATE	DELIVERY MODE
01/22/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/532,326	DAUM ET AL.	
	Examiner	Art Unit	
	REBECCA LEE	4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *14-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/22/05, 10/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Election acknowledged

Applicants' election with traverse the invention group I of claims 1-13 is acknowledged.

Applicants traverse the restriction requirement on the grounds that there is a common feature shared by claims 1 and 14, "namely the recirculation of the partial stream of the gas to the first (pre-) contact stage". However, this common feature fails to become the special technical feature under 35 U.S.C. 121 and 372. US 5194239 by Masseling et al. teaches the recirculation of gas to the first contact stage; thus the invention concept does not define a contribution which each of the inventions, considered as a whole, makes over the prior art.

Therefore, the restriction requirement is maintained, and made FINAL.

Claims 1-21 are now pending. The elected claims 1-13 have been examined. All remaining claims not drawn to the elected invention are withdrawn from further consideration as being non-elected. The following rejections are made.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "the pre-absorber". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kerner et al. (US4212855) in view of Masseling et al. (US 5194239).

Kerner et al. discloses a process of making sulfuric acid by first reacting water and sulfur dioxide in a plurality of contact stages to generate sulfur trioxide, (see abstract), then feeding the gas to an absorption tower (absorber) (Fig 1, component 14) to generate sulfuric acid. The (sulfur dioxide and sulfur trioxide containing) gas is recirculated (Column 2, lines 19-23).

Kerner et al. does not specifically teach that sulfur trioxide would be generated from sulfur dioxide and oxygen, or the contact gas has a sulfur dioxide content of more than 13% by volume.

Masseling et al. discloses a similar method to produce sulfuric acid but using sulfur dioxide and oxygen to generate sulfur trioxide (see abstract) and the contact gas consists mainly sulfur dioxide, i.e., the sulfur dioxide content is more than 13% by volume (Column 4, lines 56-62). Even though Masseling et al. discloses the contact gas

is essentially free of sulfur trioxide; (Column 4, lines 56-62), it is reasonable to assume trays of sulfur trioxide is present since "essentially free of" does not mean 100% free of.

Although Kerner uses water, it would also be obvious to use oxygen as the oxidizing agent disclosed by this reference since this oxidizing agent is known to be conventionally employed to make sulfur trioxide from sulfur dioxide (it would have been "obvious to try" the oxygen to oxidize sulfur dioxide and obtain the predictable result). In addition, oxygen is well known in the art as an oxidizing agent (see secondary reference) and the skilled artisan would have clearly appreciated that one can employ a conventional material as the oxidizing agent according to the Kerner et al. absent evidence of criticality because the substitution of one type of oxidizing agent for another that is known to be used for the same purpose is clearly within the scope of the skilled artisan.

With respect to the amount of sulfur dioxide, it is known from the secondary reference that when making sulfuric acid, the contact gas (Kerner et al. discloses making sulfuric acid from a sulfur dioxide gas feed) is known to include the claimed sulfur dioxide content, thus one skilled in the art would have clearly appreciated that in view of the secondary reference, the amount of sulfur dioxide is to be consistent with what is conventionally known absent evidence to the contrary.

Claims 2-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerner et al. (US4212855) in view of Masseling et al. (US 5194239) as applied to claim 1 above, and further in view of Winkler et al. (US6500402).

Regarding to claims 2-3, Kerner et al. in view of Masseling et al. does not specifically teach the contact gas has a sulfur dioxide content of between 14-25% by volume, or the O_2 to SO_2 ratio is adjusted to less than 1.2.

Winkler et al. teaches a similar method to produce sulfuric acid and use a gas mixture containing sulfur dioxide and oxygen to generate sulfur trioxide (see abstract), the gas mixture has an SO_2 content of 13 to 50 vol% with oxygen, and O_2 to SO_2 ratio of at least 1:2 (0.5), i.e., could be less than 1.2 (Column 3, lines 23-36).

Since the gas mixture disclosed by Winkler et al. and the contact gas taught by Kerner et al. in view of Masseling et al. are both used for the generation of sulfur trioxide, it would have been obvious to one of original skill in the art to adapt the SO_2 content and O_2 to SO_2 ratio as taught by Winkler et al. while performing the process taught by Kerner et al. in view of Masseling et al. because the SO_2 content and O_2 to SO_2 ratio affects the stoichiometry and reaction rate of the trioxide formation. In view of this, it would have been obvious to one of ordinary skill in the art to adjust the SO_2 content and O_2 to SO_2 ratio in the contact gas since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In.re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Regarding to claim 4, the combined references are silent about the volumetric portion of the feed gas to the contact gas. However, the volumetric portion of the feed gas to the contact gas affects the SO_2 content and O_2 to SO_2 ratio in the contact gas. As discussed above, the SO_2 content and O_2 to SO_2 ratio affects the stoichiometry and reaction rate of the trioxide formation, thus it would have been obvious to one of

ordinary skill in the art to adjust volumetric portion of the feed gas to the contact gas in order to obtain the desired SO_2 content and O_2 to SO_2 ratio in the contact gas since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In.re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Regarding to claims 5-6, Kerner et al. in view of Masseling et al. does not specifically teach to feed the gas into a precontact stage.

Winkler et al. teaches the (contact) gas containing sulfur dioxide and oxygen is fed into a precontact stage. SO_2 content in the gas is 13 to 50 vol%; in the precontact stage, 20-80% of the supplied SO_2 is converted to SO_3 (Column 3, lines 23-36), i.e., the process gas discharged from the precontact would have a sulfur dioxide content less that 13 vol%.

It would be obvious to one of ordinary skill in the art to feed the gas to a precontact as taught by Winkler et al. while performing the process taught by Kerner et al. in view of Masseling et al. since the precontact stage partly converts a gas with a high content of SO_2 to SO_3 to produce sulfuric acid, before the residual gas with a reduced content of SO_2 can be passed into a conventional production of sulfuric acid (Column 3, lines 23-36). One would be motivated to do so to obtain a high concentration of sulfuric acid.

Regarding to claim 7, Winkler et al. teaches the gas discharged form the precontact enters a first absorber (pre-absorber) (Column 4, lines 13-23).

Regarding to claim 8, Kerner et al. discloses the process gas is introduced into an intermediate absorption tower (absorber) (Column 4, lines 63-68, Fig 2, component 114).

Regarding to claim 9, Kerner et al. discloses the process gas is supplied to a final absorption tower (absorber) (Column 5, lines 13-15, Fig 2, component 26).

Regarding to claim 10, the combined reference is silent about to pass the process gas directly into the main contact.

It would be obvious to one of ordinary skill in the art to pass the process gas directly into the main contact to simplify the process and increase industrial applicability.

Regarding to claim 12, Kerner et al. discloses the gas is cooled to 400-480°C before introduced to the first contact stage (Column2, lines 19-23).

Regarding to claim 13, Kerner et al. discloses the proportional of the gas recycled (re-circulated) is a function of the temperature (Column 2, lines 25-27), i.e., is adjusted on the basis of the temperature.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kerner et al. (US4212855) in view of Masseling et al. (US 5194239) and Winkler et al. (US6500402) as applied to claim 9 above, and further in view of Senjo et al. (US4061743).

Kerner et al. (US4212855) in view of Masseling et al. and Winkler et al, are silent about gas scrubbing the discharged gas.

Senjo et al. disclose that hydroxide of alkali metal, which could be sodium hydroxide, is used to remove SO_x in exhaust gas (Column 1, lines 47-54).

Since the discharged gas contains SO_2, which is harmful to humans, one would be motivated to treat the discharged gas of the combined references above by gas scrubbing with sodium hydroxide, as is taught by Senjo et al. to make sure the gas released to air is substantially free of sulfur oxides.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to REBECCA LEE whose telephone number is (571)270-5856. The examiner can normally be reached on Monday-Friday 8:00 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 5712720579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. L./
Examiner, Art Unit 4181

/MICHAEL MARCHESCHI/
Primary Examiner, Art Unit 1793